Turbo NAS for Business
Scalable IP-SAN, iSCSI and NAS Storage

Secure, Reliable, Scalable and Simple

VMware® Ready, Citrix® Ready, and Microsoft® Hyper-V compatible
Scale-up storage over 400TB
10 GbE ready reaching over 1,900 MB/s and 210,000 IOPS
Multi-core processor, DDR3, SAS/SATA 6Gb/s, and USB 3.0

New Intelligent Storage Solutions

As the data value and volume of business data continue to rise, corporations need high-performance storage solutions which are secure, reliable, scalable and easy to manage. The QNAP Business Series Turbo NAS which serves as both IP-SAN (iSCSI) and NAS, can be easily utilized in different enterprise applications such as backup center, disaster recovery, file sharing, virtualization, and video editing storage.

Secure

The QNAP Turbo NAS offers various security options such as encrypted access, IP filtering, policy-based automatic IP blocking, and more. Full control of the NAS is offered down to the user and folder access rights. AES-256 volume-based encryption is also offered to prevent unauthorized access and data breach even if the hard drives or the NAS were stolen.

Reliable

The Turbo NAS is reliable with built-in features to guarantee no interruptions to the work flow of a business. The advanced RAID configurations and hot-swap capabilities are included to give better RAID performance, protection and reduced rebuilding time. The QNAP SMART data migration detects a possible drive failure and migrate data to a healthy spare drive. The dual OS embedded on the DOM architecture ensures the system will boot up when one of the operating systems is down. The dual Gigabit LAN ports can also be configured for failover which allows the NAS to sustain the failure of one network port and provide continuous services.

Scalable

As your business grows, so will your data. QNAP's scale-up solution provides over 400 TB raw capacity by cascading the QNAP RAID expansion enclosures and the Turbo NAS. The 24Gbps high speed SAS connections ensure excellent data throughput between the NAS and the enclosures.

Simple

Setting up a QNAP Turbo NAS is painless and does not require any IT skills. The QTS 4.0's intelligent desktop offers an intuitive graphic user interface, simplifying the whole Turbo NAS management.

Simple management tools such as instant SMS/email alert, hard drive S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology), Smart toolbar, and Smart dashboard are provided to keep users up-to-date on their NAS at all times.

High Performance

The QNAP Business Series Turbo NAS delivers a high-performing storage solution. Expandable to 4 GbE ports and with an optional 10 GbE card to ensure the throughput, the Turbo NAS significantly accelerates data transmission. SSD caching technology accelerates the random IOPS by 10 times and reduces I/O latency by 3 times for the storage volume. Furthermore, the Intel processor delivers the necessary power for multiple users access and guarantees data access with low latency.

Private Cloud Storage

QNAP provides powerful utilities and mobile apps which help businesses to easily build up private cloud storage for data access, sharing, synchronization, and backup anywhere, anytime via the Internet.

Primary Applications

- Centralized storage and file sharing
- Backup center in businesses
- Disaster recovery solution
- Server virtualization
- Video editing storage
- IP-SAN storage
- Private cloud storage

Centralized Storage and File Sharing

Cross-platform Sharing

The Turbo NAS supports SMB/CIFS, NFS, and AFP protocols for file sharing across Windows, Mac, Linux/UNIX networks. The integrated antivirus solution ensures business continuity by offering detection against the latest viruses, malware, worms, and Trojan horses.

Windows Active Directory (AD) and LDAP Directory Service

The Windows AD and LDAP (Lightweight Directory Access Protocol) directory service features enable the system administrator to retrieve the user accounts from Windows AD or Linux LDAP server to the Turbo NAS, reducing the time and effort in account setup. Users can use the same login name and password to access the NAS.

Centralized Log Monitoring

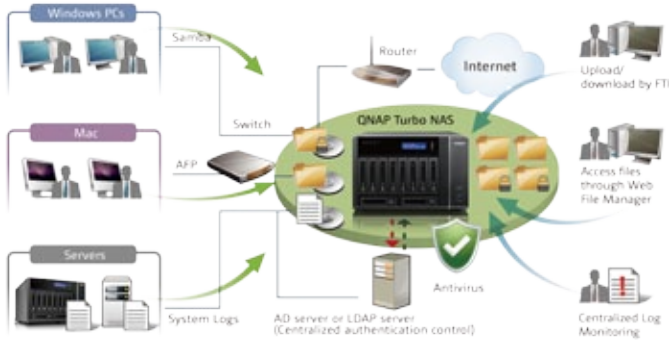
QNAP Syslog server allows the IT administrator to effectively collect and store the logs of other network devices on the Turbo NAS for efficient management and security auditing in businesses.

ISO File Archiving and Sharing

The Turbo NAS supports mounting ISO images of CD and DVD discs as network shares for efficient data archiving, storage, and sharing on a business network.

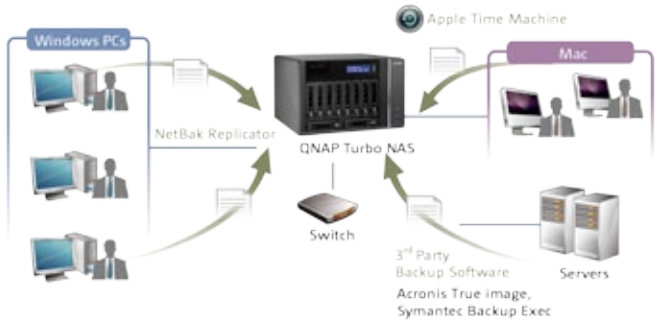
Windows ACL

The Windows ACL (access control list) feature offers sophisticated shared folder permission settings for businesses. Basic permissions and 13 advanced permissions can be set up from the Windows Explorer and synchronized with the permission settings of the Turbo NAS. In addition, the same permissions apply to AFP, FTP, Web File Manager, and Samba when Advanced Folder Permissions are enabled at the same time.



Backup Center in Businesses

The QNAP Business Series Turbo NAS is a complete backup solution that offers high performance storage, simplified and secure data management. With powerful applications such as the QNAP NetBak Replicator, data can be automatically transferred from Windows PC to the Turbo NAS instantly or scheduled. The Turbo NAS is even an ideal storage for the Apple Time Machine. Many IT companies may already use third party software, and an array of backup software such as Acronis True image and Symantec Backup Exec is supported.



Disaster Recovery Solution

QNAP offers users peace of mind, business continuity, and high availability of data by providing the ability to recover their data from disasters with the QNAP Business Series Turbo NAS.

Real-time Remote Replication

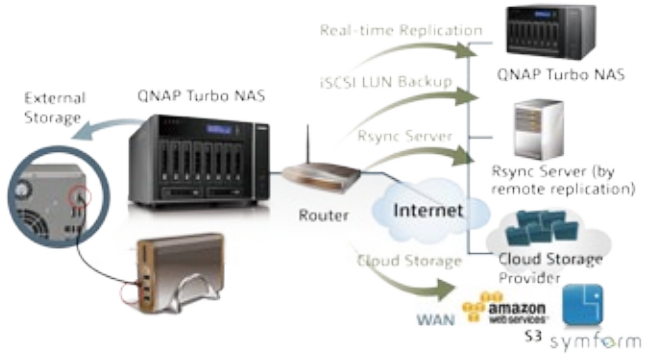
Real-time Remote Replication (RTRR) provides real-time or scheduled data replication between the local Turbo NAS and a remote Turbo NAS, an FTP server, or an external drive. With RTRR all newly added and modified files will be synchronized to a remote server or an external storage device automatically. Scheduled backup is supported to provide periodic replication from the Turbo NAS to a remote server or vice versa.

iSCSI LUN Backup and Restore

The Business Series Turbo NAS has taken iSCSI LUN backup/restore to a whole new level with snapshot technology. The IT administrator can use the LUN snapshot to back up contents in the LUN to various storage destinations, including Windows shared folders via SMB/CIFS, Linux shared folders via NFS, or local shared folders on the Turbo NAS.

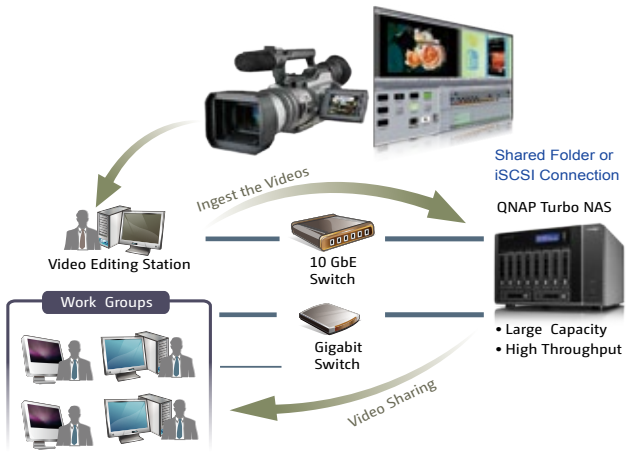
Cloud Storage Backup:

QNAP is ready to send private data to the clouds! The Turbo NAS supports Amazon S3, ElephantDrive, and Symform cloud backup storage with several backup modes including real-time, scheduled backup and versioning control so that the data can be restored from any point of time. Cloud storage can be monitored through a web browser. An extra set of all of the data stored will always be available, so remote data recovery is quick and simple.



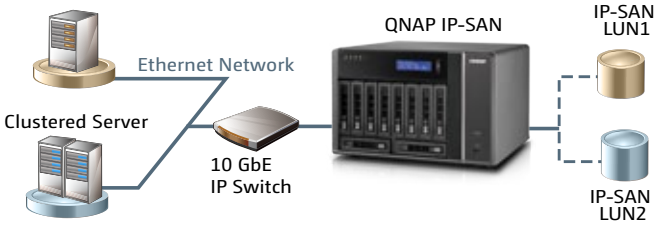
Video Editing

Digital film and video production produces volumes of data that require high performance RAID storage with sustainable throughput to balance with the demanding output of video editing. The QNAP Business Series Turbo NAS fulfills storage and video editing needs with a high-speed 10 GbE network interface. Digital videos can be quickly stored and edited on the Turbo NAS directly over the network. The Turbo NAS supports various network file sharing protocols such as NFS, AFP, and SMB/CIFS, so sharing files among PCs with different operating systems is easy. The scalable design of the Turbo NAS allows for the capacity to be expanded on the fly so the Turbo NAS can grow as the business data does.



IP-SAN Storage

The built-in iSCSI feature of the Turbo NAS provides an affordable IP-SAN (Storage Area Network) alternative for business. The QNAP IP-SAN is an excellent solution for IOPS (Input/Output Operations Per Second) intensive missions such as database service and OLTP (On-Line Transaction Processing). With the 10 GbE ready card, it offers a high speed 10 GbE network to eliminate I/O bottlenecks and boost the total throughput and IOPS. Compared with Fibre Channel SAN, the total investment is significantly lower, when including Fibre Channel SAN necessary components such as FC-SAN switch, Fiber Channel HBA (Host Bus Adapter) and FC-SAN storage.



Storage for Virtualization

The QNAP Business Series Turbo NAS is a virtualization-aware storage solution which supports VMware vSphere, Microsoft Hyper-V, and Citrix XenServer. QNAP vSphere plug-in and QNAP SMI-S provider highly increase the productivity and efficiency.

Datastore for VMware

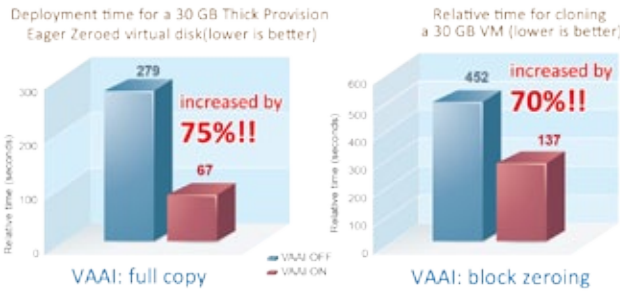
- **VAAI for iSCSI, VAAI for NAS**

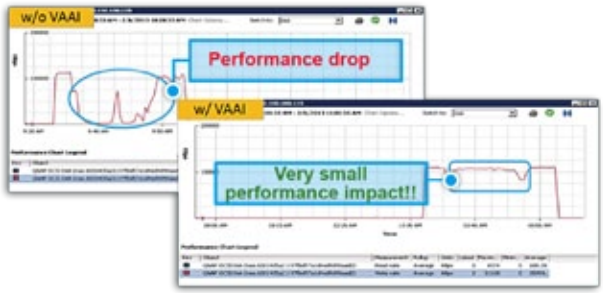
  VMware vStorage APIs Integration (VAAI) is a set of APIs that allow ESXi hosts to offload processing for certain storage-related services to storage systems. The integration of QNAP NAS with VMware VAAI offers the optimal performance for customers to deploy a virtualization environment.

  The QNAP NAS, VAAI iSCSI and VAAI NAS are VMware certified. Businesses can either select iSCSI or NFS as a centralized storage to boost performance. VAAI for iSCSI supports Full Copy (hardware-assisted copy), Block Zeroing (hardware-assisted zeroing), Hardware-assisted Locking, and Thin Provisioning with Space Reclaim. VAAI for NAS supports Full File Clone, Extended Statistics, and Reserve Space.

  The QNAP NAS uniquely supports VAAI iSCSI and VAAI NAS to enhance storage performance up to 75% in a virtualized environment.

- **Enhanced Performance by VAAI**

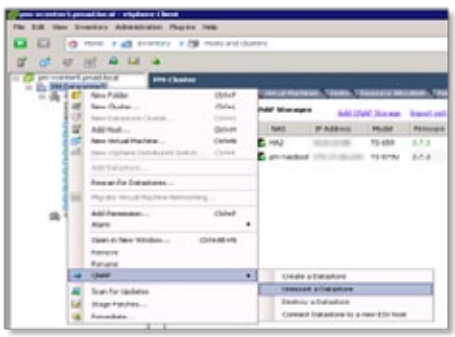




VAAI: Hardware-assisted Locking

- **vSphere Plug-in**

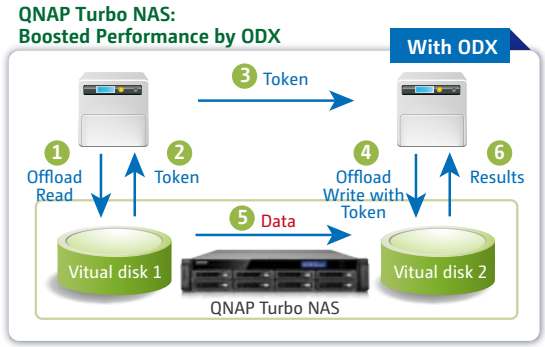
  The vSphere plug-in allows users to manage the QNAP Turbo NAS directly on the vSphere client, making datastore management more effective.

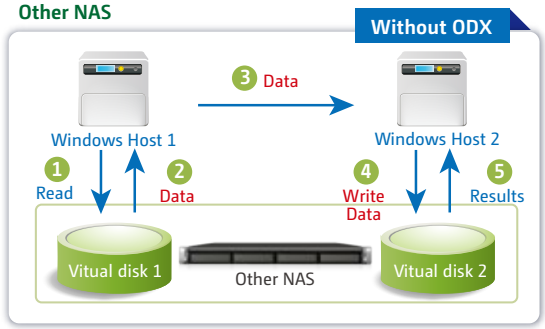


Storage for Microsoft Hyper-V

- **ODX(Offloaded Data Transfer)**

  With Offloaded Data Transfer (ODX) support, the QNAP Turbo NAS becomes a high performance iSCSI storage solution under Windows Server 2012, including Hyper-V virtualized environment. QNAP storages enable full copies of virtual machines within the NAS without requiring the Windows hosts to read and write the data. This highly reduces the loading of Windows hosts and improves the performance of copy and move operations for Windows 2012 hosts using the QNAP iSCSI storage. When providing QNAP storage to a Windows 2012 file server, the end user using Windows 8 client workstation will also benefit from the Offloaded copy process for large file transfers.





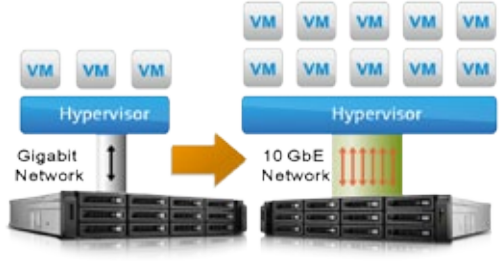
- **NAS Management via SCVMM**

  The QNAP SMI-S provider enables management of the QNAP Turbo NAS directly through Microsoft System Center Virtual Machine Manager 2012 (SCVMM).

Microsoft System Center Virtual Machine Manager 2012

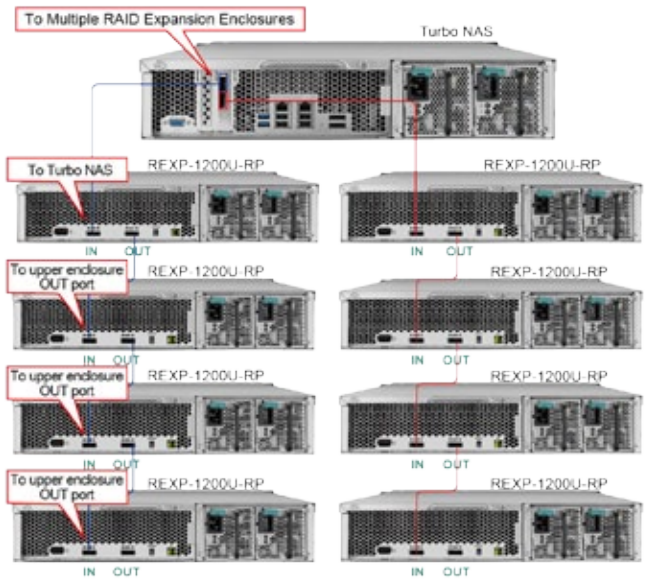
10 Gigabit Ethernet Storage Solution for the Virtualized Data Center

The QNAP Business Series Turbo NAS supports optional 10GbE adaptor, including SFP+ and 10G Base-T interface. The 10 Gb speed increases the agility of data transmission in a virtualized environment, intensifying NFS and iSCSI connection performance, and enables more VMs with multiple transactions running concurrently without performance penalty.



Scale-up Solutions

The Business Series Turbo NAS has a scalable design that grows with the data-hungry businesses. Volumes are expandable via the QNAP RAID expansion enclosures, REXP-1200U-RP and REXP-1600U-RP. Multiple RAID expansion enclosures can be cascaded to provide over 400 TB raw capacity.



Plug and Use, Seamless Capacity Expansion

With the plug-and-use design, the RAID expansion enclosure delivers a fast way to easily scale up storage capacity of the Turbo NAS. Simply connect a RAID expansion enclosure to a Turbo NAS and power it on, the Turbo NAS will detect the hard drives in the enclosure as newly installed local drives. With the Storage Manager in the QTS 4.0 intelligent operating system, the IT administrators can online expand an existing volume on the NAS without service interruption. Multiple RAID expansion enclosures can also be cascaded to provide massive capacity. The status and health of the enclosures can be monitored via the web-based management interface of the Turbo NAS.

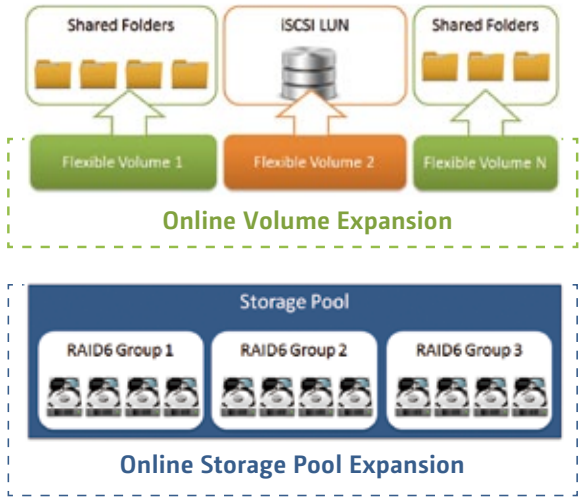
High Density, High Efficiency and High Scalability

Two RAID expansion enclosure models are available. The REXP-1200U-RP supports 12 SAS/SATA 6Gbps hard drives and SSD in 2U rack space, providing up to 36TB raw capacity. The REXP-1600U-RP supports 16 hard drives and 48TB raw capacity in 3U rack space. These RAID expansion enclosure units provide two SAS wide ports (IN port and OUT port) for host connectivity and daisy chain respectively. Each SAS wide port combines four SAS channels, with each supporting 6Gbps full duplex speed. The maximum bandwidth per host connection is 24Gbps, which delivers unprecedented performance when daisy-chaining multiple RAID expansion enclosures.

NAS models	RAID enclosures enclosure	Max. no. of RAID expansion enclosures	Max. no. of hard drives	Max. raw capacity
TS-879U-RP TS-EC879U-RP	REXP-1200U-RP	8	104	416 TB
	REXP-1600U-RP	8	136	544 TB
TS-1279U-RP	REXP-1200U-RP	8	108	432 TB
TS-EC1279U-RP TS-EC1279U-SAS-RP	REXP-1600U-RP	8	140	560 TB
TS-1679U-RP	REXP-1200U-RP	8	112	448 TB
TS-EC1679U-RP TS-EC1679U-SAS-RP	REXP-1600U-RP	8	144	576 TB

QNAP Flexible Volume

QNAP Flexible Volume provides a more secure and flexible way to store and manage the NAS data. This next generation volume offers powerful features such as storage pooling with multiple RAID, thin-provisioned volume with space reclamation, and online capacity expansion.



Secured Storage Pool for over 100-disk Deployment

To ensure the safety of valuable business data, QNAP Flexible Volume provides a secured way to deploy a large volume. The logical volume is allocated from a Storage Pool, which is composed of multiple RAID Groups to gain higher redundancy and reduce the risk of data crash from bad hard drives since the data is dispersed throughout multiple RAID arrays.

Block-based iSCSI LUN

In addition to storing data, the QNAP Flexible Volume can be utilized as an iSCSI LUN at the same time. The block-based iSCSI LUN provides less overhead which improves the over read/write performance. The block-based iSCSI LUN takes advantages of Flexible Volume such as thin-provisioning LUN with space reclamation and online capacity expansion.

Online Capacity Expansion

Increase the capacity size of the LUNs, volumes, and storage pools on the fly. The Turbo NAS allows you to add more hard drives to increase the storage capacity of the storage pool on demand. The LUN and volumes can also be expanded online without interrupting the services.

Thin-provisioned Volume

Pre-allocate storage to give the appearance of having more capacity than actually available. This allows you to consume storage on demand as data is written to disk, instead of having capacity ahead of time.

Space Reclamation

Space reclamation complements thin provisioning so storage can be freed and used for other NAS applications. Normally when data is deleted in a Space, the storage capacity cannot be transferred back to the overall storage pool. But with space reclamation, space can be reclaimed and released back to the overall storage pool. This provides a much more efficient space usage.

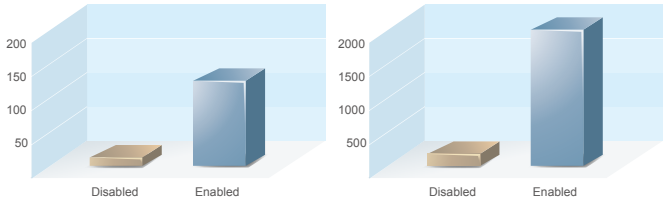
Alert for Volume/LUN Threshold

An alert can be created once a LUN or volume reaches a particular threshold size with email and SMS notifications. This prevents the storage or volume from running out of space and the administrator can provision a new storage or expand an existing volume before a critical out of space.

Exceptional Perfomance

SSD Caching Acceleration

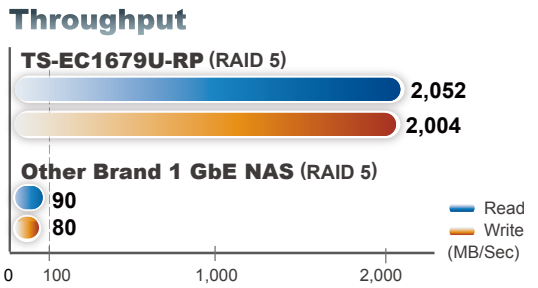
Accelerates the IOPS performance by 10 times and reduces I/O latency by 3 times for the storage volumes. This feature is perfect for IOPS demanding applications such as virtualization to significantly improve overall work flow.



Note: Cached IO performance of SSD caching is based on application and IO pattern. Before using this feature, please make sure your application is read-intensive operation.

10 Gigabit Ethernet Network Ready

The Turbo NAS has an optional 10 GbE network card which can be added to fulfill the most demanding applications requiring high bandwidth. 10 GbE has the highest data transfer rate; it is ten times faster than standard GbE.



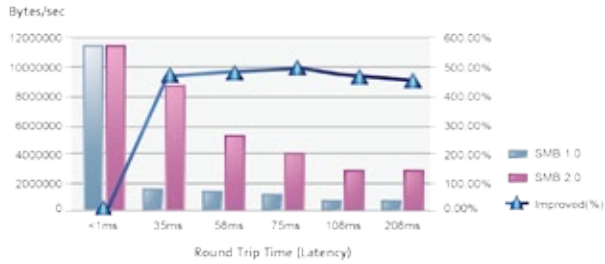
Testing Environment:
2 Client PC configurations:
Intel(R) Core(TM) i7-2600 CPU, 16GB DDR3 RAM, Windows 7 professional 64-bit, Dual-port QNAP LAN-10G2T 10GBASE-T network expansion module, IOMeter sequential read and write.
NAS configurations:
QNAP LAN-10G2T 10G2T 10GBASE-T network expansion module, 802.3ad trunking mode, full load Samsung HD103SJ 1TB SATA HDD, RAID 5.
Network Configurations:
Connect the NAS and two client PC to Cisco 4900M 10GbE switch.

SMB 2.0 Supported

The QTS 4.0 supports SMB 2.0 to improve 30-50% Microsoft Networking performance. Windows users can get faster transmission speeds and read performance even though there are multiple concurrent users or in a high latency network environment such as VPN between two offices.

Note: The SMB 2.0 is supported in Windows Vista or above versions.

SMB 1.0 and SMB 2.0 read performance in different network latency



SMB 1.0 and SMB 2.0 write performance in different network latency

Private Cloud Storage

The QNAP Turbo NAS offers business a total solution for creating private cloud storage.

myQNAPcloud service: Allows you to establish VPN connections for secure data transfer over the network.

Qsync: A utility to synchronize and share files across NAS, Windows PC and Macbook.

Qfile mobile app: Access the files on the NAS on your mobile device anytime, anywhere.

Qmanager mobile app: Manage and monitor your Turbo NAS with your iOS® or Android™ devices.

Abundant Business Features

The Turbo NAS supports abundant server applications.

Web Server

Multiple websites can be hosted on the Turbo NAS with the built-in web server and virtual host feature.

VPN Server

The VPN (Virtual Private Network) service allows users to access the NAS and other resources on the same local network from the Internet. QNAP VPN Server supports both OpenVPN and PPTP.

Syslog Server

By collecting and storing the logs of other network devices on the Turbo NAS with the Syslog server support, the IT administrator can monitor the status of these devices and collect the information necessary for further troubleshooting.

Print Server

The Turbo NAS offers cross-platform printer sharing over the network and remote printing over the Internet. IPP (Internet Printing Protocol), print job management, and Bonjour printing for Mac OS X are also supported.

Surveillance Station

Users can connect to the IP cameras via the Turbo NAS and set up a video surveillance system with comprehensive monitoring, recording, and playback features.

RADIUS Server

The RADIUS server centralizes and consolidates user authentication by maintaining a list of user accounts that are authorized for remote network access through dial-up equipment, Wi-Fi access point, or VPN connections.

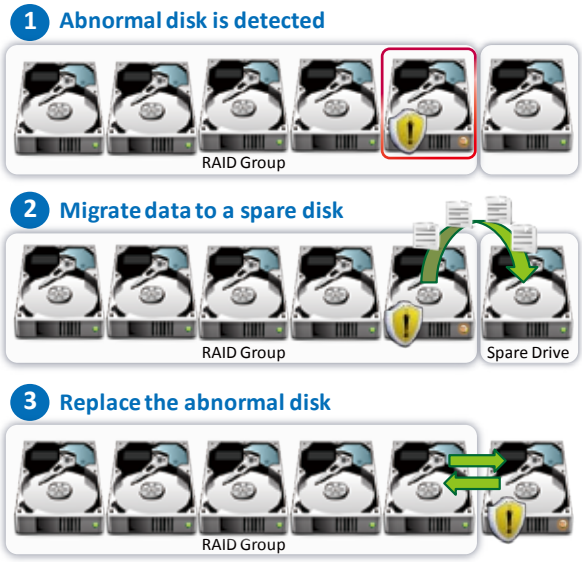
Proxy Server

With the help of the Squid App add-on, the QNAP Turbo NAS can be used as a Proxy Server.

Proactive Data Protection

QNAP SMART Data Migration

The data stored on the Turbo NAS is constantly monitored to reduce potential data loss and rebuilding time. If the Turbo NAS detects a possible drive failure or abnormal health status, the data will be proactively migrated to a new spare drive. This ensures valuable business assets are well stored and protected.



Supports TLER and ERC

TLER (Time-Limited Error Recovery) and ERC (Error Recovery Control) are now supported with compatible hard drives, improving drive error handling in RAID applications. This further prevents the hard drives from prematurely falling out of RAID arrays, forcing rebuilds, and RAID volume loss. The data will be retrieved more quickly when a hard drive takes too long to respond from bad blocks.

Bad Block Recovery

When read errors are detected in the hard drive blocks, they are automatically corrected with the healthy ones. The bad block recovery will run in background and ensure the data are well stored in the hard drives.

RAID Hot-spare and Global Hot-spare Drives

A hot spare drive can be configured so that if a hard drive in a specific RAID group fails, the hot spare drive will operate automatically. Moreover, the QNAP storage also supports global hot spare drives which allow the administrator to share the spare drives efficiently among multiple RAID Groups.

Secure Measures for Data Storage and Access

Policy-based Unauthorized IP Blocking

Users can allow, deny or auto block specified IP addresses or network domains which attempt to connect to the Turbo NAS via SSH, Telnet, HTTP(S), FTP, Samba, or AFP.

Remote Login

The Turbo NAS supports remote login by SSH (secure shell) or Telnet connection.

SSL Security (HTTPS)

The Turbo NAS supports HTTPS connection. Users can upload a secure certificate and RSA private key in X.509PEM format issued by a trusted provider to allow access the Turbo NAS by secure SSL login.

Secure FTP

The Turbo NAS offers secure data transfer with SSL/TLS (explicit) encryption. Passive FTP port range setup is also supported.

Encrypted Remote Replication by Rsync

The data on the Turbo NAS can be backed up to or from another Turbo NAS or rsync server over the network securely.

Shared Folder Management

Users can select to hide or show the network shared folders of the Turbo NAS on Windows network.

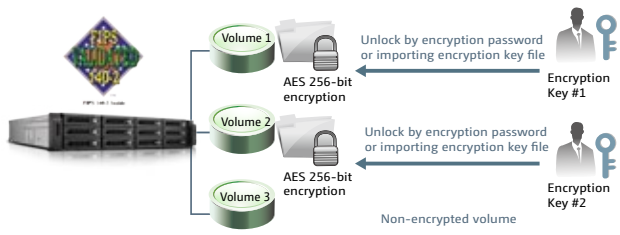
User Authority Management

Users can create user ID and password, and define the authority and quota for each user.

Secure Encryption and Sharing

FIPS 140-2 Validated AES 256-bit Volume-based Data Encryption

The disk volume with FIPS 140-2 validated AES 256-bit encryption can only be accessed by an authorized encryption password or key. This prevents sensitive data on the Turbo NAS from unauthorized access and breach, even if the hard disk drives or the entire system were stolen.



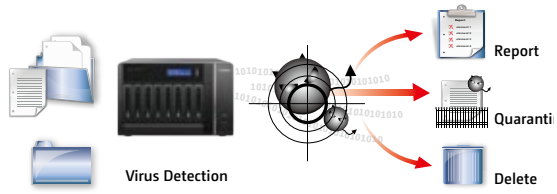
* The data encryption functions may not be available in accordance to the legislative restrictions of some countries. Please contact QNAP sales representatives for further information.

Advanced Folder Permissions

Advanced folder permissions allow users to configure folder/subfolder access to the Turbo NAS. With this feature enabled, users can manage the folder permissions from Microsoft Windows or the web-based management interface of the Turbo NAS without complicated procedures.

Antivirus

The integrated antivirus solution for the Turbo NAS ensures business continuity by offering detection against the latest viruses, malware, worms, and Trojan horses with continuous free virus database updates.



Superior Performance for IP-SAN, Virtualization and Business Storage

	TS-EC1679U-RP	TS-EC1279U-RP	TS-EC879U-RP	TS-1679U-RP	TS-1279U-RP
CPU	Quad-core Intel® Xeon® Processor E3-1225 (3.1 GHz)			Dual-core Intel® Core™ i3-2120 Processor (3.3 GHz)	
RAM	4GB DDR3 ECC RAM (expandable RAM, up to 16GB)	4GB DDR3 ECC RAM (expandable RAM, up to 8GB)	4GB DDR3 ECC RAM (expandable RAM, up to 8GB)	4GB DDR3 RAM (expandable RAM, up to 16GB)	4GB DDR3 RAM (expandable RAM, up to 8GB)
USB	USB 3.0: 2; USB 2.0: 4				
eSATA	2				
Number of Internal Hard Drives*	16 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	12 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	8 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	16 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	12 x 3.5-inch hard drive or 2.5-inch hard drive or SSD
Maximum Raw Capacity	64TB	48TB	32TB	64TB	48TB
Hard Drive Interface	SATA 6Gb/s (backward compatible with SATA 3Gb/s)				
10/100/1000 Mbps LAN Port	4 (Max. 8)	4 (Max. 6)	4 (Max. 6)	4 (Max. 8)	2 (Max. 6)
10Gbps LAN Port	Yes (optional)				
No. of Expansion Slots	2 (for network and storage expansion)				
Form Factor	3U, Rackmount	2U, Rackmount	2U, Rackmount	3U, Rackmount	2U, Rackmount
Dimensions	130 (H) x 442.4 (W) x 528.3 (D) mm 5.12 (H) x 17.42 (W) x 20.80 (D) inch	88(H) x 439(W) x 520(D) mm 3.46(H) x 17.28(W) x 20.47(D) inch	88 (H) x 439 (W) x 520(D) mm 3.46 (H) x 17.28 (W) x 20.47(D) inch	130 (H) x 442.4 (W) x 528.3 (D) mm 5.12 (H) x 17.42 (W) x 20.80 (D) inch	88 (H) x 439 (W) x 520 (D) mm 3.46 (H) x 17.28 (W) x 20.47 (D) inch
Weight	18.14 kg/39.99 lb (Net) 25.92 kg/57.14 lb (Gross)	15.88 kg/35.01 lb (Net) 22.92 kg/50.53 lb (Gross)	12.52 kg/27.61 lb (Net) 20.76 kg/45.78 lb (Gross)	18.14 kg/39.99 lb (Net) 25.92 kg/57.14 lb (Gross)	15.88 kg/35.0 lb (Net) 22.92 kg/50.53 lb (Gross)
Power	600W redundant power supply		300W redundant power supply	600W redundant power supply	
Fan	Smart fan: 3 (6cm, 12V DC)				
LCD Screen	No		Yes	No	
Noise Level	Standby: 55.20dB In operation: 55.13dB Hi-speed fan: 70.23dB Sleep mode: 54.73dB	Standby: 48.17dB In operation: 48.17dB Hi-speed fan: 64dB Sleep mode: 48.13dB	Standby: 54.57dB In operation: 54.6dB Hi-speed fan: 70.97dB Sleep mode: 54.8dB	Standby: 55.20dB In operation: 55.13dB Hi-speed fan: 70.23dB Sleep mode: 54.73dB	Standby: 48.17dB In operation: 48.17dB Hi-speed fan: 64dB Sleep mode: 48.13dB
Power Consumption	Booting: 303W In operation: 229W RAID building: 246W Standby: 182.5W Sleep mode: 89.1W	Booting: 276W In operation: 167W RAID building: 190W Standby: 150W Sleep mode: 68W	Booting: 210W In operation: 132W RAID building: 148W Standby: 109W Sleep mode: 68W	Booting: 303W In operation: 229W RAID building: 246W Standby: 182.5W Sleep mode: 89.1W	Booting: 254W In operation: 165W RAID building: 186W Standby: 150W Sleep mode: 68W

• The standard system is shipped without hard drives. All specifications are subject to change without notice.

	TS-879U-RP	TS-1270U-RP	TS-870U-RP	TS-1079 Pro	TS-879 Pro
CPU	Dual-core Intel® Core™ i3-2120 Processor (3.3 GHz)	Dual-core Intel® Processor (2.4 GHz)		Dual-core Intel® Core™ i3-2120 Processor (3.3 GHz)	
RAM	4GB DDR3 RAM (expandable RAM, up to 8GB)	4GB DDR3 RAM (expandable RAM, up to 16GB)		2GB DDR3 RAM	
USB	USB 3.0: 2 rear; USB 2.0: 4			USB 3.0: 1 front 1 rear; USB 2.0: 4	
eSATA	2				
Number of Internal Hard Drives*	8 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	12 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	8 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	10 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	8 x 3.5-inch hard drive or 2.5-inch hard drive or SSD
Maximum Raw Capacity	32TB	48TB	32TB	40TB	32TB
Hard Drive Interface	SATA 6Gb/s (backward compatible with SATA 3Gb/s)				
10/100/1000 Mbps LAN Port	2 (Max. 6)			2 (Max. 4)	
10Gbps LAN Port	Yes (optional)				
No. of Expansion Slots	2 (for network and storage expansion)			1 (for network or storage expansion)	
Form Factor	2U, Rackmount			Tower	
Dimensions	88 (H) x 439 (W) x 520 (D) mm 3.46 (H) x 17.28 (W) x 20.47 (D) inch	89 (H) x 482 (W) x 534 (D) mm 3.50 (H) x 18.98 (W) x 21.02 (D) inch	89 (H) x 482 (W) x 534 (D) mm 3.50 (H) x 18.98 (W) x 21.02 (D) inch	217.5 (H) x 327 (W) x 321.2 (D) mm 8.56 (H) x 12.8 (W) x 12.65 (D) inch	
Weight	12.52 kg/27.61 lb (Net) 20.76 kg/45.78 lb (Gross)	16.14 kg/35.58 lb (Net) 18.98 kg/41.84 lb (Gross)	9.9 kg/21.83 lb (Net) 12.74 kg/28.09 lb (Gross)	9.84 kg/21.67 lb (Net) 15.43 kg/33.98 lb (Gross)	8.39 kg/18.48 lb (Net) 13.98 kg/30.79 lb (Gross)
Power	300W redundant power supply	500W redundant power supply	300W redundant power supply	350W power supply	
Fan	Smart fan: 3 (6cm, 12V DC)	Smart fan: 2 (7 cm, 12V DC)		Smart fan: 2 (12cm, 12V DC)	
LCD Screen	Yes	No		Yes	
Noise Level	Standby: 54.57dB In operation: 54.6dB Hi-speed fan: 70.97dB Sleep mode: 54.8dB	Standby: 45.7dB In operation: 46.7dB	Standby: 45.8dB In operation: 47.5dB	Standby: 28.87dB In operation: 30.4dB Hi-speed fan: 38.75dB Sleep mode: 27.03dB	Standby: 25.87dB In operation: 27.40dB Hi-speed fan: 38dB Sleep mode: 24.67dB
Power Consumption	Booting: 175W In operation: 130W RAID building: 140W Standby: 107W Sleep mode: 68W	In operation: 188.7W Sleep mode: 83.1W	In operation: 155.2W Sleep mode: 74W	Booting: 145W In operation: 121W RAID building: 100W Standby: 94W Sleep mode: 40W	Booting: 143W In operation: 101W RAID building: 97W Standby: 81W Sleep mode: 39W

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	SS-EC2479U-SAS-RP	SS-EC1879U-SAS-RP	SS-EC1279U-SAS-RP	TS-EC1679U-SAS-RP	TS-EC1279U-SAS-RP
CPU	Quad Core Intel® Xeon® E3-1225 v2 Processor 3.2 GHz			Quad Core Intel® Xeon® E3-1225 v2 Processor 3.2 GHz	
RAM	4GB DDR3 ECC RAM (expandable RAM, up to 16GB)				
USB	USB 3.0: 2; USB 2.0: 4				
eSATA	No				
Number of Internal Hard Drives*	24 x 2.5-inch hard drive or SSD	18 x 2.5-inch hard drive or SSD	12 x 2.5-inch hard drive or SSD	16 x 3.5-inch hard drive or 2.5-inch hard drive or SSD	12 x 3.5-inch hard drive or 2.5-inch hard drive or SSD
Maximum Raw Capacity	24TB	18TB	12TB	64TB	48TB
Hard Drive Interface	SAS/SATA 6Gb/s (backward compatible with SAS/SATA 3Gb/s)				
10/100/1000 Mbps LAN Port	4 (Max. 8)				
10Gbps LAN Port	Yes (optional)				
No. of Expansion Slots	2 (for network and storage expansion)				
Form Factor	2U, Rackmount			3U, Rackmount	2U, Rackmount
Dimensions	88 (H) x 439 (W) x 520(D) mm 3.46 (H) x 17.28 (W) x 20.47 (D) inch			130 (H) x 442.4 (W) x 528.3 (D) mm 5.12 (H) x 17.42 (W) x 20.80 (D) inch	88 (H) x 439 (W) x 520 (D) mm 3.46 (H) x 17.28 (W) x 20.47 (D) inch
Weight	16.28 kg/35.89 lb (Net) 25.26 kg/55.69 lb (Gross)	15.92 kg/35.10 lb (Net) 24.9 kg/54.89 lb (Gross)	15.56 kg/34.3 lb (Net) 24.54 kg/54.10 lb (Gross)	18.3 kg/40.34 lb (Net) 27.38 kg/60.36 lb (Gross)	16.04 kg/35.36 lb (Net) 24.78 kg/54.63 lb (Gross)
Power	600W redundant power supply				
Fan	Smart fan: 3 (6cm, 12V DC)				
LCD Screen	No				
Noise Level	Standby: 56.5dB (low fan speed) In operation: 66.1dB (medium fan speed)	Standby: 56.5dB (low fan speed) In operation: 64.9dB (medium fan speed)	Standby: 56dB (low fan speed) In operation: 64.5dB (medium fan speed)	Standby: 54.5dB (low fan speed) In operation: 62.2dB (medium fan speed)	Standby: 58dB (low fan speed) In operation: 69.4dB (medium fan speed)
Power Consumption	Booting: 316W In operation: 270W RAID building: 280W Standby: 252W Sleep mode: 138.7W (with 24 x Seagate SEAGATE ST9300653SS hard drive installed)	Booting: 272W In operation: 206W RAID building: 227W Standby: 168W Sleep mode: 126.4W	Booting: 229W In operation: 157W RAID building: 188.4W Standby: 139.1W Sleep mode: 118.1W	In operation: 368W (with 16 x Seagate ST3600057SS hard drive installed)	In operation: 296W

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Accessories

Category		Order P/N	Product Description	Applied Models
LAN Card		LAN-1G2T-D	Dual-port 1 GbE network expansion card for tower model, desktop bracket	TS-879 Pro, TS-1079 Pro
		LAN-1G2T-U	Dual-port 1 GbE network expansion card for A01 series rack mount model, low-profile bracket	TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, TS-870U-RP, TS-1270U-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
		LAN-10G2T-D	Dual-port 10Gbase-T network expansion card for tower model, desktop bracket	TS-879 Pro, TS-1079 Pro
		LAN-10G2T-U	Dual-port 10Gbase-T network expansion card for A01 series rack mount model, low-profile bracket	TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, TS-870U-RP, TS-1270U-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
SAS Card		SAS-6G2E-D	Dual-wide-port storage expansion card, SAS 6Gbps, for tower model, desktop bracket	TS-879 Pro, TS-1079 Pro
		SAS-6G2E-U	Dual-wide-port storage expansion card, SAS 6Gbps, for A01 series rack mount model, low-profile bracket	TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, TS-870U-RP, TS-1270U-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
Rail Kit		RAIL-A01-35	A01 series (chassis) rail kit, max. load 35kg	TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
		RAIL-B01	B01 series (chassis) rail kit	TS-870U-RP, TS-1270U-RP
RAID Expansion Enclosure		REXP-M1600U-RP	A01 series 3U 16-bay RAID expansion enclosure including storage expansion card	TS-879 Pro, TS-1079 Pro, TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, TS-870U-RP, TS-1270U-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
		REXP-S1600U-RP	A01 series 3U 16-bay RAID expansion enclosure	TS-879 Pro, TS-1079 Pro, TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, TS-870U-RP, TS-1270U-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
		REXP-M1200U-RP	A01 series 2U 12-bay RAID expansion enclosure including storage expansion card	TS-879 Pro, TS-1079 Pro, TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, TS-870U-RP, TS-1270U-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
		REXP-S1200U-RP	A01 series 2U 12-bay RAID expansion enclosure	TS-879 Pro, TS-1079 Pro, TS-879U-RP, TS-EC879U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP, TS-870U-RP, TS-1270U-RP, SS-EC2479U-SAS-RP, SS-EC1879U-SAS-RP, SS-EC1279U-SAS-RP
Cable		CAB-SAS10M-8088	MiniSAS external cable (SFF-8088 to SFF-8088), 1.0m	REXP-1200U-RP, REXP-1600U-RP,SAS-6G2E-D,SAS-6G2E-U
		CAB-SAS05M-8088	MiniSAS external cable (SFF-8088 to SFF-8088), 0.5m	REXP-1200U-RP, REXP-1600U-RP,SAS-6G2E-D,SAS-6G2E-U
RAM		RAM-4GDR3-LD-1600	4GB DDR3 RAM, 1600MHz, long-DIMM	TS-879 Pro, TS-1079 Pro, TS-879U-RP, TS-1279U-RP, TS-1679U-RP, TS-870U-RP, TS-1270U-RP
		RAM-4GDR3EC-LD-1600	4GB DDR3 ECC RAM, 1600MHz, long-DIMM	TS-EC879U-RP, TS-EC1279U-RP, TS-EC1679U-RP, TS-EC1279U-SAS-RP, TS-EC1679U-SAS-RP

All specifications are subject to change without notice.

Software Specifications

Operating System
Embedded Linux

Supported Clients
- Windows XP, Vista, Windows 7 (32/64-bit), Windows 8 (32/64-bit), Windows Server 2003/2008 R2/2012
- Apple Mac OS X
- Linux & UNIX

Supported Browsers
- Microsoft Internet Explorer 10
- Mozilla Firefox 8+
- Apple Safari 4+
- Google Chrome

Multilingual Support
- Chinese (Traditional & Simplified), Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Brazil), Romanian, Russian, Spanish, Swedish, Thai, Turkish

File System
- Internal Hard Drive: EXT3, EXT4
- External Hard Drive: EXT3, EXT4, NTFS, FAT32, HFS+

Networking
- TCP/IP (IPv4 & IPv6: Dual Stack)
- Dual Gigabit NICs with Jumbo Frame*
  - Failover
  - Multi-IP Settings
  - Port Trunking/NIC Teaming (Modes: Balance-RR, Active Backup, Balance XOR, Broadcast, IEEE 802.3ad/Link Aggregation, Balance-TLB and Balance-ALB)
- Optional Dual-port 10 GbE and 1 GbE Network Expansion Cards*
- Service Binding Based on Network Interfaces*
- Proxy Client, Proxy Server
- DHCP Client, DHCP Server
- Protocols: CIFS/SMB, AFP (v3.3), NFS (v3), FTP, FTPS, SFTP, TFTP, HTTP(S), Telnet, SSH, iSCSI, SNMP, SMTP, and SMSC
- UPnP & Bonjour Discovery
- USB Wi-Fi Adapter Support

Security
- IP Filter & Policy-based Automatic IP Blocking
- Network Access Protection with Auto-blocking: SSH, Telnet, HTTP(S), FTP, CIFS/SMB, AFP
- Encrypted Access: HTTPS, FTP with SSL/ TLS (Explicit), SSH/SFTP (admin only), Encrypted Remote Replication (Rsync over SSH)
- CIFS Host Access Control for Shared Folders
- Antivirus Protection
- FIPS 140-2 Validated AES 256-bit Volume-based Data Encryption**
- AES 256-bit External Drive Encryption*
- Importable SSL Certificate
- Instant Alert via E-mail, SMS, Beep, and LCD Panel*

Disk Management
- QNAP Flexible Volume with thin-provisioning and space reclamation supported
- Supports Storage Pool
- Online Volume Expansion
- Online Storage Pool Expansion
- Online RAID Capacity Expansion and Online RAID Level Migration
- SMART Data Migration
- Bad Block Scan and Hard Drive S.M.A.R.T.
- Bad Block Recovery
- RAID Recovery
- Bitmap Support

Power Management
- Wake on LAN*
- Internal Hard Drive Standby Mode
- Scheduled Power on/off
- Automatic Power on after Power Recovery
- USB and Network UPS Support with SNMP Management

Access Right Management
- Batch Users Creation
- Import/Export Users
- User Quota Management
- Local User Access Control for CIFS, AFP, FTP, and WebDAV
- Subfolder Permissions Support for CIFS/SMB, AFP, FTP and Web File Manager

Domain Authentication Integration
- Microsoft Active Directory (AD)
- LDAP Server
- LDAP Client
- Domain Users Login via CIFS/SMB, AFP, FTP, and File Station

Web Administration
- Multi-window, Multi-tasking based System Management
- Movable Icons and Personalized Desktop
- Smart Toolbar and Dashboard for Neat Display on System Status
- Smart Fan Control
- Dynamic DNS (DDNS)
- SNMP (v2 & v3)
- Resource Monitor
- Network Recycle Bin for File Deletion via CIFS/SMB and AFP
- Automatic Cleanup
- File Type Filter
- Comprehensive Logs (Events & Connection)
- Syslog Client
- Firmware Live Update
- System Settings Backup and Restore
- Restore to Factory Default
- Mobile App Qmanager for Remote Monitoring

File Server
- File Sharing across Windows, Mac, and Linux/UNIX
- Protocols: CIFS/SMB, AFP, NFS, FTP/FTPS, HTTP/HTTPS (Web File Manager), WebDAV
- Windows ACL
- Advanced Folder Permission for CIFS/SMB, AFP, FTP
- Shared Folder Aggregation (CIFS/SMB)

File Station
- Supports ISO Mounting (Up to 256 ISO Files)
- Creates and Sends Download Links for Sharing Public Files with Expiration Time and Password Protection
- Drag-n-drop Files via Chrome and Firefox Browsers
- Photo, Music, and Video Preview and Playback Empowered by Built-in Transcoding Technology
- File Compression (ZIP or 7z)
- Advanced Search
- Mobile App: Qfile for File Browsing and Management

FTP Server
- FTP over SSL/TLS (Explicit)
- Concurrent Connections: Max 256
- Passive FTP Port Range Control
- FTP Bandwidth & Connection Control
- Supports FXP & Unicode

Backup Station
- Remote Replication Server (over Rsync)
- Real-time Remote Replication (RTRR) to another QNAP NAS or FTP Server
- Works as Both RTRR Server & Client with Bandwidth Control
- Real-time & Scheduled Backup
- Encryption, Compression, File Filter, and Transfer Rate Limitation
- Encrypted Replication between QNAP NAS Servers
- Desktop Backup by QNAP NetBak Replicator for Windows
- Apple Time Machine Support with Backup Management
- Data Backup to Multiple External Storage Devices
- Synchronizes with Cloud Storage: Amazon S3, ElephantDrive, Symform, Dropbox, and Google Drive
- Third Party Backup Software Support: Veeam Backup & Replication, Acronis True Image, ARCserve Backup, EMC Retrospect, Symantec Backup Exec, LaCie SilverKeeper, etc.

iSCSI (IP SAN)
- iSCSI Target
- Multi-LUNs per Target
- Up to 256 Targets/LUNs Combined
- Supports LUN Mapping & Masking
- Block-based LUN
- Thin-provisioned LUN with Space Reclamation Supported
- Online LUN Capacity Expansion
- Supports SPC-3 Persistent Reservation
- Supports MPIO & MC/S
- iSCSI LUN Backup, One-time Snapshot, and Restore
- iSCSI Connection and Management by QNAP Finder (Windows)
- Virtual Disk Drive (via iSCSI Initiator)
- Stack Chaining Master
- Max No. of Virtual Disk Drives: 8

Server Virtualization & Clustering
- VMware vSphere (ESX/ESXi 4.x, 5.x)
- VMware VAAI for iSCSI and VAAI for NAS
- vSphere Plug-in
- Citrix XenServer (6.0)
- Windows Server 2012 Hyper-V
- Supports Microsoft ODX
- QNAP SMI-S Provider for Microsoft SCVMM
- Windows Server 2012 Failover Clustering

Storage Plug & Connect via Windows Qfinder by QNAP
- Create and Map Shared Folders
- Create and Connect to iSCSI Target/LUN

myQNAPcloud Service
- Private Cloud Storage and Sharing
- Free Host Name Registration (DDNS)
- Auto Router Configuration (via UPnP)
- CloudLink for Remote Access without Complicated Router Setup
- myQNAPcloud Connect for Easy VPN Connection (Windows VPN Utility)

Qsync
- Syncs Files among Multiple Devices through the NAS
- Option for Not Removing Files on the NAS during Synchronization
- Selective Synchronization
- Shares Securely with SSL
- Team Folder
- Shares Files by Links via E-mail
- Uploads Photos or Videos to Qsync Folder Automatically via Qfile
- Restores Files from Network Recycle Bin
- File Name Conflict Policy
- Option for Filter Settings
- Privilege Control for Qsync Users
- Supports Windows & Mac OS

Web Server
- HTTP/HTTPS Connections
- Built-in MySQL Server
- Web-based Management via phpMyAdmin (QPKG)
- Virtual Hosts: Max 32

Database Server
- Built-in MySQL Server
- Web-based Management via phpMyAdmin

Print Server
- Max No. of Printers: 3
- Supports Internet Printing Protocol
- Print Job Display and Management
- IP-based and Domain Name-based Privilege Control
- Supports Apple Bonjour Printing

Syslog Server
- Centralized Log Monitoring and Archiving
- Immediate Email Alerts
- Supports Log Filtering

RADIUS Server
- Centralized Account Management and Authentication for Network Access
- Supports 802.1x Security Authentication
- TFTP Server with PXE Booting (Read-only)

VPN Server
- Secure Remote Access: PPTP & OpenVPN VPN services
- Remote Access to Other Resources on Local Network
- Max No. of Clients: 30

Surveillance Station Pro
- Supports over 1,400 IP Cameras
- Includes 1 Free Camera License
- Up to 16 Camera Channels via Additional License Purchase*
- Intelligent Video Analytics (IVA) for Advanced Video Search
- Visual Aid by E-map
- Surveillance Client for Mac
- Mobile App: VMobile (iOS and Android)

Antivirus
- Protection against Viruses, Trojans, and Other Threats
- Free Virus Databases Update on Manual or Scheduled Basis
- Multiple Scan Tasks (Max: 64, Concurrent: 5) with Custom Folder Selection and Scheduled Scanning
- Email Notification upon Task Completion or Virus Detection
- Quarantines or Deletes Infected Files

APP Center
- Add New Features by Online Installation of over 90 Official and Community Software Add-ons
  (The actual available software add-ons may vary depending on the NAS platform)

* This feature may vary according to different models.

** The data encryption functions may not available in accordance with the legislative restrictions of some countries.

Design and specifications are subject to change without notice.

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